

CF MATHS

SAT Math Worksheet

Linear Equations and Systems

35 exam-style Question Bank paraphrases • independent practice

■ **Practice first. Solutions later.**

- 35 questions from the remaining Chapter 1 Question Bank paraphrases
- space to show algebra and annotate mistakes
- no solution immediately below any question
- full worked solutions collected together only after Question 35

How to use this worksheet. Complete all questions without looking at the solutions. Show enough algebra that you can diagnose mistakes later. Source IDs identify the official College Board SAT Math Question Bank items used as the basis for these CF Maths paraphrases/reconstructions; official wording is not reproduced.

Worksheet questions

Question 1

Source ID: e6cb2402

Difficulty: Hard

In the equation $4(kx + 5) = 16x + 22$, k is a constant. What value of k makes the equation have no solution?

Question 2

Source ID: 935f3403

Difficulty: Easy

A storage tank initially contains 22,000 kilograms of sand. Material is removed at a constant rate. After 3 hours, 18,100 kilograms remain. If the same rate continues, after how many total hours will 14,200 kilograms remain?

Question 3

Source ID: 1ce51655

Difficulty: Medium

A storage tank initially contains 15,500 kilograms of sand. Material is removed at a constant rate. After 6 hours, 11,900 kilograms remain. If the same rate continues, after how many total hours will 8,900 kilograms remain?

Question 4**Source ID:** b51c173d**Difficulty:** Easy

The graph of $h(x) = 2x - 8$ has x -intercept $(a, 0)$ and y -intercept $(0, b)$. What is $a + b$?

Question 5**Source ID:** 17d80dc3**Difficulty:** Medium

The graph of $h(x) = -7x + 21$ has x -intercept $(a, 0)$ and y -intercept $(0, b)$. What is $a + b$?

Question 6**Source ID:** b3abf40f**Difficulty:** Hard

A tutoring package has a fixed starting charge of \$180 and then costs \$40 per unit. Let $C(n)$ be the total cost for n units. Which function models the cost, and what is $C(5)$?

Question 7**Source ID:** c81f1c2f**Difficulty:** Medium

An equipment rental has a fixed starting charge of \$120 and then costs \$45 per unit. Let $C(n)$ be the total cost for n units. Which function models the cost, and what is $C(11)$?

Question 8**Source ID:** 0d6ab461**Difficulty:** Easy

A gym membership has a fixed starting charge of \$20 and then costs \$20 per unit. Let $C(n)$ be the total cost for n units. Which function models the cost, and what is $C(13)$?

Question 9**Source ID:** c39dbbdf**Difficulty:** Medium

For the linear function $f(x) = -x + c$, it is known that $f(2) = -12$. What is c ?

Question 10**Source ID:** e7343559**Difficulty:** Easy

For the linear function $f(x) = 5x + c$, it is known that $f(5) = 15$. What is c ?

Question 11**Source ID:** cc3e9528**Difficulty:** Hard

For the linear function $f(x) = 3x + c$, it is known that $f(0) = 7$. What is c ?

Question 12**Source ID:** 9aaf7786**Difficulty:** Medium

For the linear function $f(x) = -6x + c$, it is known that $f(3) = -11$. What is c ?

Question 13**Source ID:** db0107df**Difficulty:** Easy

For the linear function $f(x) = -2x + c$, it is known that $f(1) = -7$. What is c ?

Question 14**Source ID:** 1087f6c4**Difficulty:** Medium

For the linear function $f(x) = -3x + c$, it is known that $f(6) = -20$. What is c ?

Question 15**Source ID:** 24854644**Difficulty:** Easy

For the linear function $f(x) = -5x + c$, it is known that $f(-5) = 25$. What is c ?

Question 16**Source ID:** 686b7244**Difficulty:** Hard

For the linear function $f(x) = 6x + c$, it is known that $f(0) = 0$. What is c ?

Question 17**Source ID:** b5f62071**Difficulty:** Hard

For the linear function $f(x) = -4x + c$, it is known that $f(4) = -8$. What is c ?

Question 18**Source ID:** d909cd31**Difficulty:** Medium

For the linear function $f(x) = -2x + c$, it is known that $f(3) = -3$. What is c ?

Question 19**Source ID:** e6545fa8**Difficulty:** Easy

For the linear function $f(x) = -3x + c$, it is known that $f(6) = -27$. What is c ?

Question 20**Source ID:** 1362ccde**Difficulty:** Hard

For the linear function $f(x) = -x + c$, it is known that $f(7) = -1$. What is c ?

Question 21**Source ID:** f5563c26**Difficulty:** Easy

For the linear function $f(x) = -4x + c$, it is known that $f(-2) = 7$. What is c ?

Question 22**Source ID:** 59813abf**Difficulty:** Hard

For the linear function $f(x) = x + c$, it is known that $f(-2) = 6$. What is c ?

Question 23**Source ID:** cb8f449f**Difficulty:** Medium

For the linear function $f(x) = -x + c$, it is known that $f(-1) = 6$. What is c ?

Question 24**Source ID:** 3f5a3602**Difficulty:** Hard

For the linear function $f(x) = -5x + c$, it is known that $f(1) = 4$. What is c ?

Question 25**Source ID:** f75bd744**Difficulty:** Hard

For the linear function $f(x) = -4x + c$, it is known that $f(-5) = 30$. What is c ?

Question 26**Source ID:** ee7b1de1**Difficulty:** Hard

For the linear function $f(x) = x + c$, it is known that $f(3) = 5$. What is c ?

Question 27**Source ID:** 8f0c82e2**Difficulty:** Medium

For the linear function $f(x) = -x + c$, it is known that $f(-4) = 12$. What is c ?

Question 28**Source ID:** 84d0d07e**Difficulty:** Easy

For the linear function $f(x) = -2x + c$, it is known that $f(2) = 1$. What is c ?

Question 29**Source ID:** 6c71f3ec**Difficulty:** Hard

For the linear function $f(x) = -2x + c$, it is known that $f(4) = -8$. What is c ?

Question 30**Source ID:** 0b221d05**Difficulty:** Medium

For the linear function $f(x) = -2x + c$, it is known that $f(1) = -10$. What is c ?

Question 31**Source ID:** 968e9e51**Difficulty:** Medium

For the linear function $f(x) = -5x + c$, it is known that $f(-2) = 3$. What is c ?

Question 32**Source ID:** a049f400**Difficulty:** Hard

For the linear function $f(x) = -4x + c$, it is known that $f(6) = -15$. What is c ?

Question 33**Source ID:** b31c3117**Difficulty:** Medium

For the linear function $f(x) = 5x + c$, it is known that $f(-5) = -16$. What is c ?

Question 34**Source ID:** 842cec4d**Difficulty:** Easy

For the linear function $f(x) = 2x + c$, it is known that $f(-1) = -7$. What is c ?

Question 35**Source ID:** 55ea82f3**Difficulty:** Hard

For the linear function $f(x) = -x + c$, it is known that $f(-5) = 9$. What is c ?

Solutions

The solutions are intentionally collected here rather than placed beside the questions.

Question 1

Expand: $4kx + 20 = 16x + 22$. For no solution the x -coefficients must match while the constants remain different, so $4k = 16$ and $\boxed{k = 4}$.

Question 2

The amount removed in 3 hours is $22,000 - 18,100 = 3,900$, so the rate is 1,300 kg/h. Solve $22,000 - 1,300t = 14,200$ to get $\boxed{t = 6}$ hours.

Question 3

The amount removed in 6 hours is 3,600, so the rate is 600 kg/h. Solve $15,500 - 600t = 8,900$ to get $\boxed{t = 11}$ hours.

Question 4

For the x -intercept, $0 = 2x - 8$, so $a = 4$. The y -intercept is $b = -8$. Hence $a + b = 4 - 8 = \boxed{-4}$.

Question 5

For the x -intercept, $0 = -7x + 21$, so $a = 3$. The y -intercept is $b = 21$. Thus $a + b = \boxed{24}$.

Question 6

The model is $C(n) = 40n + 180$. Therefore $C(5) = 40(5) + 180 = \boxed{380}$ dollars.

Question 7

The model is $C(n) = 45n + 120$. Therefore $C(11) = 45(11) + 120 = \boxed{615}$ dollars.

Question 8

The model is $C(n) = 20n + 20$. Therefore $C(13) = 20(13) + 20 = \boxed{280}$ dollars.

Question 9

Substitute the known point: $-12 = (-1)(2) + c$. Hence $c = -12 - (-1)(2) = \boxed{-10}$.

Question 10

Substitute the known point: $15 = (5)(5) + c$. Hence $c = 15 - (5)(5) = \boxed{-10}$.

Question 11

Substitute the known point: $7 = (3)(0) + c$. Hence $c = 7 - (3)(0) = \boxed{7}$.

Question 12

Substitute the known point: $-11 = (-6)(3) + c$. Hence $c = -11 - (-6)(3) = \boxed{7}$.

Question 13

Substitute the known point: $-7 = (-2)(1) + c$. Hence $c = -7 - (-2)(1) = \boxed{-5}$.

Question 14

Substitute the known point: $-20 = (-3)(6) + c$. Hence $c = -20 - (-3)(6) = \boxed{-2}$.

Question 15

Substitute the known point: $25 = (-5)(-5) + c$. Hence $c = 25 - (-5)(-5) = \boxed{0}$.

Question 16

Substitute the known point: $0 = (6)(0) + c$. Hence $c = 0 - (6)(0) = \boxed{0}$.

Question 17

Substitute the known point: $-8 = (-4)(4) + c$. Hence $c = -8 - (-4)(4) = \boxed{8}$.

Question 18

Substitute the known point: $-3 = (-2)(3) + c$. Hence $c = -3 - (-2)(3) = \boxed{3}$.

Question 19

Substitute the known point: $-27 = (-3)(6) + c$. Hence $c = -27 - (-3)(6) = \boxed{-9}$.

Question 20

Substitute the known point: $-1 = (-1)(7) + c$. Hence $c = -1 - (-1)(7) = \boxed{6}$.

Question 21

Substitute the known point: $7 = (-4)(-2) + c$. Hence $c = 7 - (-4)(-2) = \boxed{-1}$.

Question 22

Substitute the known point: $6 = (1)(-2) + c$. Hence $c = 6 - (1)(-2) = \boxed{8}$.

Question 23

Substitute the known point: $6 = (-1)(-1) + c$. Hence $c = 6 - (-1)(-1) = \boxed{5}$.

Question 24

Substitute the known point: $4 = (-5)(1) + c$. Hence $c = 4 - (-5)(1) = \boxed{9}$.

Question 25

Substitute the known point: $30 = (-4)(-5) + c$. Hence $c = 30 - (-4)(-5) = \boxed{10}$.

Question 26

Substitute the known point: $5 = (1)(3) + c$. Hence $c = 5 - (1)(3) = \boxed{2}$.

Question 27

Substitute the known point: $12 = (-1)(-4) + c$. Hence $c = 12 - (-1)(-4) = \boxed{8}$.

Question 28

Substitute the known point: $1 = (-2)(2) + c$. Hence $c = 1 - (-2)(2) = \boxed{5}$.

Question 29

Substitute the known point: $-8 = (-2)(4) + c$. Hence $c = -8 - (-2)(4) = \boxed{0}$.

Question 30

Substitute the known point: $-10 = (-2)(1) + c$. Hence $c = -10 - (-2)(1) = \boxed{-8}$.

Question 31

Substitute the known point: $3 = (-5)(-2) + c$. Hence $c = 3 - (-5)(-2) = \boxed{-7}$.

Question 32

Substitute the known point: $-15 = (-4)(6) + c$. Hence $c = -15 - (-4)(6) = \boxed{9}$.

Question 33

Substitute the known point: $-16 = (5)(-5) + c$. Hence $c = -16 - (5)(-5) = \boxed{9}$.

Question 34

Substitute the known point: $-7 = (2)(-1) + c$. Hence $c = -7 - (2)(-1) = \boxed{-5}$.

Question 35

Substitute the known point: $9 = (-1)(-5) + c$. Hence $c = 9 - (-1)(-5) = \boxed{4}$.